VALIDATION REPORT

PROACTIVA TIJUQUINHAS LANDFILL GAS CAPTURE AND FLARING PROJECT IN BRAZIL

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DET NORSKE VERITAS

VALIDATION REPORT

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Summary:
Det Norske Veritas Certification Ltd. (DNV) has performed the validation of the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project" in Brazil on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the project, as described in the project design document version 3 of January 2007, with the exception of the approval from the Parties involved and the confirmation of the contribution to the sustainable development of the host Party by Brazil, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0001 version 05. Hence, DNV requests the registration of the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project" as CDM project activity.

Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, along with letters of approval from Spain and France. Due to the approval of a new version of the applied methodology ACM0001 the revised PDD in line with the version 05 of the methodology has been made publicly available for a new period of 30 days starting on 19 February 2007.

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Report title: *Proactiva Tijuquinhas Landfill Gas Capture and Flaring project in Brazil*	
Work carried out by: Mathsy K, Ricardo Alvarez,Luis Filipe Tavares, Wilson Tang.	
Work verified by: Miguel Rescalvo (acting)	
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Abbreviations

ABES	Associação Brasileira de Engenharia Sanitária
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LFG	Landfill Gas
MP	Monitoring Plan
MSW	Municipal Solid Waste
MVP	Monitoring and Verification Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

Proactiva Medio Ambiente and Veolia Proprete have commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project" in Brazil (hereafter called "the project"). This report summarises the findings of the validation, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consisted of the following personnel:

Mr Ricardo Alvarez	DNV Certification Spain	Team Leader, GHG auditor
Mr Luis Filipe Tavares	DNV Certification Brazil	CDM validator, Sector expert.
Ms Mathsy K	DNV Certification Bangalore	GHG auditor
Mr Wilson Tang	DNV Certification China	Sector expert.
Mr Miguel Rescalvo	DNV Certification Oslo	Technical reviewer (acting)
Mr. Einar Telnes	DNV Certification Oslo	Technical reviewer

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0001 version 05 /14/. The validation team has, based on the recommendations in the Validation and Verification Manual /13/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

1.3 Description of Proposed CDM Project

The proposed project activity envisages the installation of an active landfill gas (LFG) collection and flaring system at the Tijuquinhas municipal solid waste landfill site which is owned and operated by Proactiva Brazil. The landfill site is located in Biguaçu in the state of Santa Catarina, Brazil.

The landfill started its operation in 1991 and is intended for the final disposal of municipal solid waste (MSW) from the 21 municipalities of Florianópolis County. The landfill site covers a total

area of 200 000m^2 and is divided in three zones. Zones 1 and 2 have already been filled to their maximum capacity, while zone 3 is the future lined disposal area, which overlies the existing filled zones 1 and 2.

The project activity's start date is 01 January 2007 and has an expected operational lifetime of 21 years. The project involves reduction in GHG emissions by maximising the capture and flaring of the landfill gas, which would otherwise have been passively flared to up to 10% for odour reduction and safety reasons.

The GHG emissions reduction from the project is projected to be 845 513 tonnes of CO_2 equivalent (tCO_2e) during the first 7 year renewable crediting period, resulting in an average annual emissions reduction of 120 788 tCO_2e/year.

2 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents
II follow-up interviews with project stakeholders
III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /13/. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project" is enclosed in Appendix A to this report.

Findings established during the initial validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CARs) are issued, where:

i) mistakes have been made with a direct influence on project results;
ii) validation protocol requirements have not been met; or
iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term clarification may be used where additional information is needed to fully clarify an issue.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below).A request for **Clarification (CL)** is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	***Ref. to Table 2***	***Summary of project participants' response***	***Final conclusion***
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation protocol tables

2.1 Review of Documents

The PDD for the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project" version 03 dated January 2007 /2/, its previous versions and supporting documents submitted by Proactiva Brasil together with additional background documents relating to the baseline and project design listed below were reviewed as part of the validation:

- Financial Analysis: Cost study analysis conducted for the project activity/6/.
- SCS Engineering study for the project and "Situacao Queimadores 1" to justify the 10% flaring of LFG in the baseline scenario. /7/
- LFG Generation model along with CER calculation. /8/,
- Brazilian grid emission factor calculation. /9/,
- Letter from FATMA and a study conducted by the ABES (Associação Brasileira de Engenharia Sanitária e Ambiental) on request of the Public Minister of the Santa Catarina State confirming common practice in Santa Marta /10/
- Contracts with all the 21 municipalities to ensure the continuous dumping of waste to the landfill site through 2013 /11/ and
- World Bank study - The Landfill Gas-to-Energy Initiative for Latin America and the Caribbean- February 2006 by ESAMP (Energy Sector Management Assistance Program) giving reference to electricity generation costs for LFG projects. /12/

2.2 Follow-up Interviews

DNV Brazil and DNV India performed interviews with Veolia Environmental Services and Proactiva Brasil to confirm selected information and to resolve issues identified in the document review. Mr Luis Antonio Garcia Correa - Environmental Control Director of FATMA, Brazil, responsible for issue of operating license was also contacted. Additionally, a teleconference was conducted with the project developers, Mr. Wilson Tang (DNV sector expert) and DNV India on 17 January 2007 to resolve issues relatedto the baseline flaring of LFG. The main topics of the interviews are summarised in

Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
• Proactiva • FATMA • Veolia Environmental Services.	➢ Estimation of emissions reduction. ➢ The current practice of the LFG capture (capture rate) ➢ The contract with the municipalities. ➢ Project design and implementation. ➢ Applicable regulation and permits. ➢ Baseline scenario (LFG flared). ➢ Capture efficiency during the passive flaring.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The initial validation of the project identified seven corrective action requests (CARs) and ten requests for clarification (CLs) for the project. The project participants were invited to provide their response to the CARs and CLs listed in Table 3 of the Validation Protocol in Appendix A to this report, which were resolved through further communications between the client and DNV.

The initial findings of the validation were presented to the project developer in a draft validation report dated 05 December 2006. The project participant's response to DNV's preliminary findings, which also included the submission of a revised PDD version 2, addressed all preliminary findings to DNV's satisfaction. A new version 03 of the PDD was issued to comply with the requirements of the new version 05 of the methodology ACM0001.

2.4 Internal Quality Control

The draft validation report including the initial validation findings were reviewed before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3 VALIDATION FINDINGS

The findings of the validation for the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project" are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation version 03 of January 2007.

3.1 Participation Requirements

The participants for this project activity are Proactiva Brasil from Brazil, the host Party, Proactiva Medio Ambiente from Spain and Veolia Propreté from France. All the Parties i.e. Brazil, France and Spain meet the requirements to participate in CDM.

The project's contribution to sustainable development in the host country needs to be confirmed by the DNA of Brazil. Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approvals of voluntary participation from the DNA of Brazil, Spain and France /3/, /4/ & /5/

3.2 Project Design

The project aims to maximise the capture and flaring of the LFG produced at the Tijuquinhas landfill site, thus avoiding the emission of methane to the atmosphere. The technology to be employed includes installation of an active LFG collection and flaring system consisting of a gas collection system, airtight covering of the landfill and flaring equipment.

The landfill started its operation in 1991 and its total surface is 200 000m^2 destined to the final disposal of MSW from 21 municipalities. The landfill site is managed by the project proponent from 2002. The average waste handling capacity of the landfill is 240 000 tonnes per year. Approximately 2 million tonnes of MSW have been received till date since the start of operation in 1991 and another 1.8 million tonnes of waste is expected to be received by 2013.

The landfill site is divided into 3 zones. Zone 1 and 2 have reached its full capacity and zone 3, overlying zone 1 and 2, is destined to receive the future waste. Zone 3, has a liner at its base and a leachate collection system. The collection system consists of horizontal collection trenches placed at every 5m depth, 25 m apart through the entire length of the zone. These trenches are interconnected with vertical wells which consist of pipes perforated at the lower parts. The LFG collection system uses high density polyethylene (HDPE) collection piping system which carries the LFG from the network of wells to the blower. This system then delivers the gas to a central enclosed flaring device where LFG is flared at temperatures higher than 700°C.

The starting date of the project activity is forecasted to be 01 January 2007 with an expected operational lifetime of 21 years. A renewable crediting period of 7 years is selected starting 05 July 2007.

The project is expected to bring improvement on sustainable development through reducing methane emissions and minimizing the risk of explosions at the site. The transfer of technology and specialized operators will be needed for project's implementation and operation, which means a positive impact on employment and construction capacity skills.

The validation did not reveal any information indicating that the project can be seen as a diversion of ODA funding towards Brazil.

3.3 Baseline Determination

The project applies the approved baseline methodology ACM0001 /14/ (version 5, 22 December 2006) – "*Consolidated baseline methodology for landfill gas project activities*". This methodology is applicable to project activities that reduce greenhouse gas emissions through LFG capture and destruction by flaring and/or generation of electricity. In the case of the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project", the destruction of methane will occur through flaring only.

The selected baseline scenario is the atmospheric release of the LFG with 10 % of the captured LFG being flared for odour reduction and safety reasons. This figure has been estimated and justified based on a study conducted by SCS Engineers taking into account the number and the

density of the passive flares, the venting wells conditions and construction and the operating hours /7/. The "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project" does not have any contractual obligations or regulatory requirements to flare the gas produced at the landfill site. This is confirmed in the operation license granted by FATIMA /10/.

3.4 Additionality

In accordance with ACM0001 version 05, the additionality of the project is demonstrated through the "*Tool for the demonstration and assessment of additionality"*/16/, which includes the following steps:

Step 0: Preliminary screening based on the starting date of the project activity: The start date of the crediting period is proposed to be after the expected date of registration of the project and hence this step is not applicable.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations: The project proponent has identified four plausible baseline scenarios i.e. (a) continuation of the current situation: the LFG would continue to be released to the atmosphere and only passive flaring of gases for odour reduction and safety reasons would occur; (b) implementation of the project activity without CDM revenues; (c) production and sale of electricity or heat from landfill gas and (d) collection of landfill gas and sale the raw gas to a final customer. All four scenarios identified are in compliance with the applicable legal and regulatory requirements for the region.

Production of electricity from landfill gas has been deemed as an unlikely option due to the maturity of this technology in the region and the lack of sufficient financial incentives. A study conducted by ESAMP (Energy Sector Management Assistance Program) support by the World Bank - The Landfill Gas-to-Energy Initiative for Latin America and the Caribbean, February 2006- concludes that a reliable and constant LFG capture and flaring system is required for producing electricity from LFG and thus it is necessary that the landfill operator is skilled on the newly implemented technology and that the landfill operation practices do not interfere with the constant biogas generation. This is the main reason for implementing the electricity generation component in a second phase in most of landfill sites. Secondly, the relatively low price range for the electricity sale ($0.029 -$0.07 per kWh) makes the implementation of just the LFG flaring component of projects more favourable. In a review of pre-feasibility studies conducted by the World Bank for similar projects in Brazil, it has been deemed accepted that the production of electricity with LFG is an unlikely option.

No end users have been identified for the eventual utilization of the LFG offsite, thus this alternative is not a plausible scenario. Furthermore, the landfill site does not have any cleaning station installed. It has also been confirmed that no facility exists in the site to distribute LFG through a network directly to the end user nor is a compression station installed on site to compress the LFG to allow its eventual distribution by road.

In conclusion, the remaining alternatives are the continuation of the current practice by mostly venting the LFG, the implementation of the project without CDM revenues and the project itself.

Step 2: Investment analysis: The project proponent has applied a simple cost analysis since the project activity does not generate any financial or economic benefits other than CDM related income. The estimated investment on the gas collection system is USD $1 540 300 and the needed investment for the gas flaring system is foreseen to be USD $ 643 000. The investment

analysis /6/ has been assessed by DNV and it can be concluded that the figures included are conservative and within the range provided by the IPCC.

Considering that there are no other sources of revenue expected than the sale of CERs, and the additional costs necessary for increasing the LFG capture capacity, without having any revenues, it can be concluded that the project is not a likely baseline scenario.

Step 3 - Barrier analysis: Not selected (only Step 2 of tools of additionality has been selected)

Step 4 - Common practice analysis: A study conducted by the ABES /10/, (Associação Brasileira de Engenharia Sanitária e Ambiental) on request of the Public Minister of the Santa Catarina State, audited 18 licensed landfills and concluded that 41% of these sites did not have the required management practices and controls. The project activity is the first of its kind in the state of Santa Catarina and no other landfill sites in the state have installed LFG collection and flaring facilities. The same was confirmed by a letter provided by FATMA dated 18 December 2006 /10/. A few other similar projects implemented in Brazil are all linked to the CDM and hence not considered in the common practice analysis.

Step 5 - Impact of CDM registration: Since there is no other income from the project activity, the registration of the project as a CDM activity will represent the only revenue source for the project and will significantly alleviate the economic and financial hurdles of the project.

In conclusion, it has been verified that the project is not financially attractive and faces different barriers and thus is not the most likely baseline scenario. Hence, the emissions reduction is additional to those that would occur in the absence of the project activity.

3.5 Monitoring Plan

The project correctly applies the approved monitoring methodology ACM0001 /14/(Version 05 of 22 December 2006) - "Consolidated monitoring methodology for landfill gas projects activities".

The monitoring methodology is applicable as the project activity envisages the capturing and flaring of LFG. In line with the methodology and the "tool to determine project emissions from flaring of gases containing methane" the project proposes the monitoring, among others, of the following parameters:

- LFG flared. Since all the LFG is just flared, one flow meter is used to monitor the flow rate and the total amount of gas flared is measured and calculated in line with the methodology.
- Flare efficiency. The project involves use of enclosed flares and continuous monitoring of the flare efficiency on an hourly basis.
- Methane fraction in the LFG.
- Temperature and pressure of the LFG.
- Electricity consumption for the project.
- Volumetric fraction of each component in the LFG.
- Volumetric fraction of O_2 in the exhaust gas of flare.
- Concentration of methane in the exhaust gas.

- Temperature of the exhaust gas from flare.

All the data will be archived for two years after the crediting period.

The calibration requirements are followed as per manufacturer's specifications and in the presence of an official entity when required by the methodology. The responsibilities for project operation and monitoring and reporting have been defined. Procedures for data handling, record maintenance, internal audits, performance review and emergency situation have been defined in the PDD.

3.6 Calculation of GHG Emissions

Emission reductions are directly monitored and calculated ex-post, using the approach indicated in ACM001, version 05, /14/., The project also applies the "Tool to determine the project emissions from flaring gases containing methane"/15/.

For the ex-ante estimation of emission reductions, the expected LFG generation of the landfill is determined using the IPCC first order decay model. The emission reductions are claimed from the 3 zones defined in the landfill site. GHG emission reductions are estimated considering values of k = 0.1 (which is adequate for the high precipitation conditions of the landfill site); 50% of methane content of LFG; L_0 = 116 m^3CH_4/ton waste (based on the type, composition and organic content of waste); collection efficiency of 30 % for zone 1 & 2 and 70% for zone 3 which is the active zone where the filling of waste occurs. The assumptions used to estimate LFG generation are appropriate and based on the IPCC Good Practice Guidance.

An adjustment factor (AF) of 10% due to the passive flaring of LFG has been selected after carrying out a 3-day campaign observation on site with a view to evaluate the efficiency of the current system in place of 66 wells. The results are shown in the document "Situacao Queimadores 1.pdf" and in the report issued by SCS Engineers /7/. These documents show that even when conservative assumptions are made (capture rate of 20%, 8 operating hours and a combustion efficiency of 50% for the open flares) the efficiency of the actual system in place does not exceed 7%. Hence, DNV's opinion is that the adjustment factor of 10% is appropriate and conservative.

The emissions due to use of electricity is estimated as a product of the grid emission factor and the quantity of electricity used (MW) in the project activity for operating the flares and blowers. The grid emission factor is fixed *ex-ante* as 0.2677 tCO_2/MWh. The combined margin calculated as per ACM0002 for the Brazilian South-Southeast-Midwest interconnected grid considering data for the years 2003, 2004 and 2005 is 0.2611 tCO_2/MWh /9/ and thus the emission factor applied in this project is considered appropriate. The *ex ante* estimation of project emissions due to the utilization of electricity is 33.42 tCO_2 per year. This represents only 0.028 % of the total claimed annual emissions reduction.

The project emissions from flaring gases are proposed to be calculated as per the "Methodological tool to determine project emissions from flaring gases containing methane". For the ex-ante estimation of project emissions a flare efficiency of 100% has been assumed. This is based on documentation from the flares supplier showing that with the type of flares to be installed the methane presence in the exhaust gas is close to zero. This will be monitored and thus, if the flare efficiency is not 100% the project emissions will be calculated as the sum of emissions from each hour, based on the methane flow rate in the residual gas and the flare efficiency during each hour, as follows:

$$PE_{flare,y} = \sum TM_{RG,h} * (1 - \eta_{flare,h}) * \frac{GWP_{CH4}}{1000}$$

The project, on implementation, is expected to result in annual average reductions of 120 788 tCO_2e over the first seven year renewable crediting period. Considering the amount of uncertainty related to the methane generation and collection efficiency, which depends on the actual design and engineering of the project, this might be achievable if the project is implemented suitably. However, experiences with other landfills have shown that the methane generation and collection efficiency of the landfills projected by the first order decay model has an inherent uncertainty of almost 50% and hence the amount of CERs, which will be monitored ex-post, might vary from the projected amount.

3.7 Environmental Impacts

An environmental impact study was conducted for the Tijuquinhas landfill project as per the Environmental Impact Assessment (EIA-RIMA by Brazilian law) in 2003 during landfill expansion. The environment state agency FATMA issued a supplementary operation licence No. 2171 further to the EIA study. The letter issued by FATMA (letter no. 2989 on 18/09/2006) states that the landfill is in accordance with the national standards, also declaring that there are no obligations for LFG flaring and there are not any landfill in Santa Catarina State flaring LFG.

The project activity only involves the capturing and flaring of landfill gas and hence no major adverse environmental impacts are expected to occur. The project activity results in positive environmental impacts like reduction in GHG emissions into the atmosphere, reduction in odors, fire and risks associated with explosion due to better management of the landfill site. Also, since the project involves installation of a high temperature flares which works at temperatures higher than 700° C (with a retention time of 0.3 sec), along with methane, other volatile organic compounds and ammonia as well are destroyed in the process.

3.8 Comments by Local Stakeholders

The project proponents conducted a local stakeholder consultation meeting on 7 November 2006, at the Municipal library of Biguaçu, State of Santa Catarina. Prior to conducting the stakeholder meeting, the first version of the PDD (English and Portuguese) were sent across to the identified stakeholders by email on 21 October 2006 and then by post, explaining the details of the project. All relevant stakeholders were invited for the meeting.

The stakeholders raised questions on exploration of alternatives to the utilisation of landfill gas, use of fossil fuels for ignition or combustion of landfill gas, reason for choice of the 7 year (renewable 2ce) crediting period instead of the fixed 10 year crediting period and the benefits to the community due to the implementation of the project activity. The project proponent responded to the comments explaining that project proponent had considered each of the alternatives to the project activity and explained to the stakeholders the problems or the hindrances to other alternatives. It was explained to the stakeholders that the total amount of fossil fuel/electricity used in the project activity is monitored and the same will be reduced from the emission reductions claimed from the project activity.

The project proponent also explained that the project activity would bring additional activities in the area of Biguaçu during the construction and operation phase involving local subcontractors.

The project would also result in training of employees required for operate and maintenance in this technology which is new to this region requiring qualified personnel. This would also provide social benefits and contribute to sustainable development in the State of Santa Catarina.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD version 01 of 10-2006 was made publicly available on DNV's climate change website (http://www.dnv.com/certification/climatechange/Projects/ProjectDetails.asp?ProjectId=857) and Parties, stakeholders and NGOs are through the CDM website invited to provide comments during a 30 days period from 19 November 2006 to 18 December 2006. No comment was received.

The PDD version 3 of January 2007 was made publicly available for a new 30 days consultation period due to change in the version of the methodology applied. This new consultation period started on 19 February 2007.

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project" in Brazil. The validation was performed on the basis of UNFCCC criteria for CDM project activities and relevant Brazilian criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The project participants are Proactiva Brasil from Brazil, Proactiva Medio Ambiente from Spain and Veolia Proprete of France. The host Party Brazil and participating countries Spain and France meet all relevant participation requirements.

The project objective is to capture and flare the landfill gas produced at Tijuquinhas Landfill site to avoid emissions of methane to the atmosphere. The technology to be employed involves the installation of an efficient active recovery system composed by a collection and transportation pipeline network and an enclosed flaring system.

The project applies the approved baseline and monitoring methodology ACM0001 version 05 (22 December 2006), i.e. "Consolidated baseline and monitoring methodology for landfill gas project activities" along with the "Tool to determine project emissions from flaring gases containing methane". The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound. It is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are additional to any that would occur in the absence of the project activity.

The monitoring methodology has been correctly applied. The monitoring plan sufficiently specifies the monitoring requirements. By burning of landfill gas the project results in reductions of CH_4 emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

The estimated emissions average reduction is 120 788 tCO_2/year over the first seven year crediting period. Considering the level of uncertainty related to the methane generation and collection efficiency, which depends on the actual design and engineering of the project, this might be achievable if the project is implemented as designed. However, experiences with other landfills have shown that the methane generation and collection efficiency of the landfills projected by the first order decay model has an inherent uncertainty of almost 50% and hence the amount of actual emissions reduction, which will be monitored ex-post, might vary from the projected amount.

The local stakeholder consultation was carried out by Proactiva. Comments by Parties, stakeholders and NGOs were also invited via the UNFCCC web-site and the comments received were taken into account in the validation.

In summary, it is DNV's opinion that the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project", as described in the revised and resubmitted project design document version 03 of January 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology. Hence, DNV requests the registration of the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project" as a CDM project.

Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, along with letters of approval from Spain and France.

REFERENCES

Documents provided by the project proponent that relate directly to the project:

/1/ CDM PDD for the "CDM-PDD for the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project", Version 01 dated October 2006.

/2/ CDM PDD for the "CDM-PDD for the "Proactiva Tijuquinhas Landfill Gas Capture and Flaring project", Version 02 dated January 2007.

/3/ DNA of Brazil, Letter of Approval awaited.

/4/ DNA of Spain, Letter of Approval awaited.

/5/ DNA of France, Letter of Approval awaited.

/6/ Financial Analysis: Cost Study Analysis conducted for the project activity.

/7/ SCS Engineering study calculation sheet for the project and Situacao queimadores1 to justify the 10% flaring of LFG in the baseline scenario.

/8/ LFG Generation model along with CER calculation.

/9/ Brazilian Grid emission factor calculation.

/10/ Letter from FATMA and a study conducted by the ABES, (Associação Brasileira de Engenharia Sanitária e Ambiental on request of the Public Minister of the Santa Catarina State) confirming common practice in Santa Marta.

/11/ Contracts with all the 21 municipalities to ensure the continuous dumping of waste to the landfill site through 2013.

/12/ World Bank study - The Landfill Gas-to-Energy Initiative for Latin America and the Caribbean, February 2006 by ESAMP (Energy Sector Management Assistance Program) giving reference to electricity generation costs for LFG projects.

Background documents related to the design and/or methodologies employed in the design or other reference documents:

/13/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/14/ CDM Executive Board: Approved Baseline and Monitoring Methodology *ACM0001:* "*Consolidated baseline and monitoring methodology for landfill gas project activities*". Version 05 of 22 December 2006.

/15/ CDM-Executive Board: "*Tool to determine the project emissions from flaring of gases containing methane"*, EB 28, 15 December 2006.

/16/ CDM-Executive Board: *Tool for the demonstration and assessment of additionality*, Version 02 of 28 November 2005.

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APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	CAR1	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR1	Prior to submission of this report to the CDM Executive Board, DNV will have to receive the DNA approvals from Brazil, Spain and France will be are awaited.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	The validation did not reveal any information indicating that the project can be seen as a diversion of ODA funding towards Brazil.
8. Parties participating in the CDM shall designate a national	CDM Modalities and	OK	The DNA of the Brazil is the

Requirement	Reference	Conclusion	Cross Reference / Comment
authority for the CDM	Procedures §29		Comissão Interministerial de Mudança Global do Clima, the DNA of France is Mission Interministérielle de l'Effet de Serre and the DNA of Spain is Oficina Española de Cambio Climático, Ministerio de Medio Ambiente
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	Brazil ratified the Kyoto Protocol on 23 August 2002. Spain and France ratified the Kyoto Protocol on 31 May 2006.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	Spain and France's assigned amount are calculated and recorded.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	Spain and France have a national system for estimating GHG emissions and a national registry.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1

Requirement	Reference	Conclusion	Cross Reference / Comment
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f		Table 2, Section D
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	CDM Modalities and Procedures §40	OK	The PDD was published on 19 November 2006 on (http://www.dnv.com/certification/climatechange/Projects/ProjectDetails.asp?ProjectId=857) and Parties, stakeholders and NGOs are invited to provide comments until 18 December 2006, through the CDM website. No comments were received. The version 3 of the PDD applying the version 5 of the methodology ACM0005 was made public for a new 30 days period on 19 February 2007.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	Yes.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	Yes, the project is located at the municipality of Biguaçu, around 30 km northwest of Florianópolis on the continental side of the Santa Catarina coast in Brazil.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The project's system boundary includes the physical site of the project activity where the LFG is captured and flared. The system boundary mainly includes the collection system including the vertical and horizontal wells, the blower and the enclosed flare.		OK
A.2. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR	The project's design engineering reflects current good practice installing vertical wells, horizontal trenches and collection pipes to the blower and a flare. A leachate		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			collection system to enhance the collection efficiency of the LFG will also be installed.		
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	Yes, the project will result in better performance compared to the common practice.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	The project technology is not likely to be substituted by other or more efficient technologies with the project period.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR	Yes, the operation and maintenance of the capture and flaring equipment requires some expertise in order to generate the forecast amount of emission reductions.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Yes, the project makes provisions for meeting the training and maintenance needs in the monitoring plan for the project activity.		OK
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	The project proponent is requested to submit all relevant permits and licences for construction and operation of the project. It needs to be clarified if the EIA of Proactiva Tijuquinhas landfill was approved with the condition that part of LFG was expected to be captured and flared. The EIA approval may be submitted.	~~CL 1~~	OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR	This needs to be confirmed by the DNA of Brazil	CAR 1	

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	This will be confirmed on receipt of the Brazilian DNA's approval for the project activity.	CAR 1	
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project will help prevent potential hazards due to fire and explosion, unpleasant odours and air pollution due to the landfill site operation. The project will also result in direct and indirect employment opportunities for the population around the landfill site thereby enhancing the social conditions in the area.		OK
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/	DR	The project applies approved baseline methodology ACM0001 version 5, 22 December 2006 "Consolidated baseline methodology for landfill gas project activities", which has been approved by the CDM Executive Board.		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	In line with the methodology ACM0001, version 5, the project activity involves capture and flaring of the landfill gas which was otherwise released into the atmosphere. Hence the baseline		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			methodology is applicable to this project activity.		
B.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR	The application of the methodology and the baseline determination is transparent. In line with the methodology, the project activity captures and flares the landfill gas. The chosen baseline that in the absence of the project activity, majority of the landfill gas would have been released to the atmosphere. The project developer is requested to provide: 1. operation permit or license 2. operation contract Regulatory or obligatory requirements for LFG capture and flaring may be confirmed against the licenses. The baseline is defined as 10% flaring of the captured landfill gas. The data related to the flaring, even when only for safety reasons, in the past need to be submitted to DNV.	~~CL 1~~	OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	The regulations in the host country do not require the project proponent to flare any	~~CL 1~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			amount of the captured landfill gas. The only requirement is the capture of the gas for safety reasons. The baseline is defined 10% flaring of the captured landfill gas. This needs to be confirmed with the license and the operation data.		
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	The baseline has been established on a project specific basis. The current method of landfill gas collection and flaring has to be described. The % of LFG captured that is flared at the landfill site needs to be confirmed.	~~CL 1~~	OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	This needs to be confirmed on receipt of the permits and licenses.	~~CL 1~~	OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	Yes.		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	Yes, in the absence of the proposed CDM project activity, three other alternatives have been identified- • Continuation of the current practice of waste management, with atmospheric release of the LFG and occasional passive flaring. • Investment in gas collection and power/heat generation systems and supply to customer. • Collection and sale of the captured LFG directly to an end user. The project itself without CDM revenue should also be defined as a plausible	~~CL 2~~ ~~CL 8~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			alternative to the project activity. The selected baseline of the first option i.e.: the continuation of present scenario represents the most likely baseline scenario.		
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR	In accordance with ACM0001 the additionality of the project is demonstrated through the "*Tool for the demonstration and assessment of additionality"*, which includes the following steps: *Step 0 -Preliminary screening based on the starting date of the project activity:* As the starting date of the crediting period is after the expected date of registration of the project, this step is not applicable. *Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations:* The possible baseline scenarios are: a) LFG would continue to be released to the atmosphere with passive flaring for odour reduction b) investing in LFG collection and power generation equipment and sale power / heat generated to a customer c) collection of the LFG and sale of the raw gas directly to end user as fuel. All three, scenarios are in compliance with all applicable legal and regulatory requirements. Another option, (d) implementation of the project of capturing and flaring LFG without CDM incentives needs to be added and	~~CL 2~~ ~~CL 3~~ ~~CAR 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			analyzed. The project developer is requested to justify, based on objective facts, why the option of producing electricity is not the most plausible scenario. *Step 2 - Investment analysis:* Since the CDM project activity does not generate any financial or economic benefits other than CDM revenue, the simple cost analysis scenario is applied. Considering the additional costs necessary for increasing the LFG capture capacity, without having any revenues, the project is not a likely baseline scenario. As this project activity does not have any financial benefits, it does not prove to be a viable baseline scenario. The financials of the project activity need to be submitted. *Step 3 - Barrier analysis:* Not selected (Step 2 is selected only) *Step 4 - Common practice analysis:* An analysis on all the similar landfill projects implemented including the projects in the pipeline need to be discussed in detail. *Step 5 - Impact of CDM registration:* As there is no income from the project, the sale of CERs will present the only revenue for the project and will significantly alleviate the economic and financial hurdles of the	~~CL8~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			project.		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	The risk of change in legislation providing for mandate in flaring the captured LFG is the main risk to the baseline. This has been proposed to be monitored.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes.		OK
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR	The project's start date is 01 January 2007 with an operational lifetime of 21 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	The project proponent has chosen a renewable crediting period with the start date of the crediting period being 05 July 2007.		OK
D. Monitoring Plan *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR	The project applies approved monitoring methodology ACM0001 version 05 of 22		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			December 2006 "Consolidated monitoring methodology for landfill gas project activities", which has been approved by the CDM Executive Board.		
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	In line with the methodology ACM0001, version 5, the project activity involves capture and flaring of LFG which was otherwise partially released into the atmosphere. In line with the methodology the project will monitor the following parameters. 1. LFG captured/flared – measured; However, this meter needs to be calibrated periodically by an officially accredited entity. 2. Flare efficiency – continuous monitoring of flare efficiency as per the "tool to determine project emissions due to flaring of gases containing methane"; 3. Continuous monitoring of the temperature of the exhaust gas 4. Project Emissions – calculated as per "tool to determine project emissions from flaring of gases containing methane" 5. Methane fraction of LFG – measured 6. Volumetric fraction of each component in the LFG – measured; 7. Volumetric fraction of O_2 in the exhaust gas of flare – measured;	~~CL 5 CAR 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			8. Volumetric flow rate of the residual gas – measured; 9. Concentration of methane in the exhaust gas – measured; 10. LFG temperature and pressure – measured; 11. Electricity consumption for the project – measured; The fossil fuel used in the baseline or project activity for pumping equipments or ignition of LFG need to be included in the monitoring plan. All the data will be archived for two years after the crediting period.		
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	Yes, the monitoring plan reflects good monitoring and reporting practices.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	Yes.		OK
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	In line with the methodology, the data as stated in D.1.2 will be monitored for calculating the project emissions. However, the monitoring plan will also need to include the amount of fossil fuel used to ignite the landfill gas.	~~CAR 4~~	OK
D.2.2. Are the choices of project GHG indicators	/1/	DR	Yes, the choice of the GHG indicators is as		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
reasonable?			per the approved baseline methodology ACM0001.		
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes		OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Yes		OK
D.3. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	No potential leakages are established as per the methodology ACM0001.		OK
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR	Same as D.3.2		OK
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/1/	DR	Same as D.3.2		OK
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR	Same as D.3.2		OK
D.4. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	In line with the methodology, the emission reductions are calculated as the difference of the quantity of LFG captured and flared in the project activity minus the gas currently	~~CL 1~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			flared in the baseline scenario. The Brazilian regulations do not require any capture and flaring of the LFG. However, this needs to be confirmed with the licenses and permits. Any change in the legislation or requirement for gas to be flared is monitored as per the methodology.		
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Baseline includes 10% flaring of the captured landfill gas. This needs to be substantiated with the data available for the LFG flared in the baseline.	~~CL 1~~	OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?			Yes		OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	It needs to be checked during the interviews with the DNA of Brazil, whether the data concerning environmental, social and economic impacts of the project need to be monitored.		OK
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	/1/	DR	Same as above.		OK
D.5.3. Will it be possible to monitor the specified	/1/	DR	Yes		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
sustainable development indicators?					
D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	The DNA approval for the host country needs to be submitted.	CAR 1	
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR	Yes, the project management responsibility has been clearly described.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	Yes.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	Yes, training of monitoring personnel is carried out annually to include training on LFG collection system, calibration and impact of the monitoring on CDM activity.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Yes.		OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Procedures for calibration of monitoring equipment need to be submitted.	~~CL 4~~	OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Yes		OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Yes		OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Procedures for record handling need to be provided.	~~CL 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Procedures for dealing with monitoring data adjustments and uncertainties need to be provided.	~~CL 4~~	OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	Yes		
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	Procedures for internal audits, performance reviews and corrective actions to be taken need to be identified and submitted.	~~CL 4~~	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	Same as above.		OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Same as above.		OK
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
E.1. Project GHG Emissions *The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	The "Tool to determine project emissions from flaring gases containing methane" has been used to incorporate the project emissions. The amount of fossil fuel consumed in the	~~CAR 4~~ ~~CL9~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			project activity to ignite the fossil fuel needs to be accounted for. The expected electricity demand needs to be justified.		
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	The calculation sheets for the GHG calculations need to be submitted.	~~CL 6~~	OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	The CEF considered in 83kgCO_2e/MWh from IPCC 2002 value for Brazil. This is not considered correct while the emission factors of the Brazilian grids are known and thus should be applied instead of a less accurate data from IPCC. The flare efficiency for the enclosed fare system is monitored on a continuous basis in line with the tool to determine project emissions. For the estimation of project emissions a flare efficiency of 100% has been applied. This needs to be justified.	~~CAR 3~~	OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	Yes.		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Yes		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.2. Leakage *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.*					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	No potential leakages are established as per ACM0001.		OK
E.2.2. Have these leakage effects been properly accounted for in calculations?	/1/	DR	Same as E.2.1		OK
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	/1/	DR	Same as E.2.1		OK
E.2.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	Same as E.2.1		OK
E.2.5. Have conservative assumptions been used when calculating leakage?	/1/	DR	Same as E.2.1		OK
E.2.6. Are uncertainties in the leakage estimates properly addressed?	/1/	DR	Same as E.2.1		OK
E.3. Baseline Emissions *The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	The specific first order decay model used for the calculation of the methane generation needs to be clarified. If it is not the EPA or IPCC model, the model should be provided or a comparison of results applying the EPA LANDGEM model or the IPCC model.	~~CAR 5~~ ~~CL 7~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			The following data have been used for the estimation of the baseline emission data: • Methane content of LFG – 50 %; • Methane generation rate (Lo) – 116 (the actual value calculated based on the landfill composition); • Methane generation rate constant (k) – 0.1; • Flare efficiency – 100% - This needs to be revised since it is not considered to be a conservative value • Collection efficiency of LFG – 70% for zone 3, 30% for zones 1 and 2.		
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	Yes		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	The calculation sheet for baseline emission calculation needs to be submitted	~~CL 6~~	OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	Same as above.		OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	Same as above.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	Same as above.		OK
E.4. Emission Reductions *Validation of ex-ante estimated emission reductions*.					
E.4.1. Will the project result in fewer GHG emissions	/1/	DR	The project is forecasted to reduce CO_2		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
than the baseline scenario?			emissions to the extent of 845 513 t CO_2 e over the defined first renewable 7 year crediting period.		
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/		Yes, an analysis on the environmental impacts due to the project activity has described adequately.		OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	Yes, the Brazilian law required an environmental impact assessment to be carried out in order to obtain an environmental license. The project proponents have conducted an EIA in 2003. The environmental permit may be submitted.	~~CL 1~~	OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	No, since the project involves capture and flaring of the landfill gas, there are no adverse environmental effects due to the project.		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	There are no trans-boundary impacts due to the project activity.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	There are no adverse environmental impacts identified due to the project activity.		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	Same as A.3.1		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
G. Stakeholder Comments *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	Yes, relevant stakeholders have been identified and consulted.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	A document describing the project activity was emailed as well as posted to the concerned stakeholders.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Yes, a stakeholder consultation forms a part of the requirement by the DNA of Brazil and was carried out on 7 November 2006.		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	Yes.		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	Yes. Due account of the comments received from the stakeholders has been taken and addressed in the PDD.		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1: The approvals from the DNA of Brazil, Spain and France confirming voluntary participation need to be submitted. The confirmation from Brazil of the project contribution to the sustainable development of the country has not been obtained.	A.3.2 A.3.3	The Brazilian, French and Spanish DNA require the issuance of the final validation report prior issuing the letter of approval. All letters will be provided with the request of registration as required by the EB.	The Brazilian DNA requires the issuance of the final report for granting the approval. Prior to submission of this report to the CDM Executive Board, DNV will have to receive the DNA approvals from Brazil, Spain and France, including the confirmation from Brazil of the project contribution to the sustainable development of the country.
CAR 2: Common practice analysis for additionality should provide an analysis of the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region. This analysis needs to be based on third parties independent opinions.	B.2.7	The common practice analysis is based on data provided by the official statistics on urban solid waste in Brazil* – *Pesquisa Nacional de Saneamento Básico 2000* (PNSB 2000). The information is publicly available on the following web address: http://www.ibge.gov.br/home/presidencia/noticias/27032002pnsb.shtm In addition, a letter from the Fatma date 18th December 2006, confirms that the baseline scenario and that the technology of the project activity is not diffused within the State of Santa Catarina.	OK. The letter from FATMA states that the practise of LFG burning has not diffused in the state of Santa Catarina. This CAR is closed.
CAR 3: The CEF value considered for the project	D.1.2 E.1.3	The CEF will only be used to estimate the GhG emissions associated with the	OK. The grid emission factor has been fixed

* IBGE – Instituto Brasileiro de Geografia e Estatística.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
activity is 83kgCO2e/MWh from IPCC 2002 value for Brazil. The IPCC values are to be chosen only where the local values are not available. As required by the methodology the grid emission factor can be estimated using either ACM0002 or AMS-I.D. Furthermore, it needs to be clearly specified in the PDD if this factor is fixed ex-ante or updated ex-post.		electricity consumption. The maximum electricity demand will be less than 30kW. Consequently, the small scale methodology I.D, version 9 has been used to estimate the CEF. Referring to section 9 b, of this methodology, the weighted average emissions of the current generation mixed has been used. Applying the newly released 2006 IPPC Guidelines for National Greenhouse Gas Inventories to the consumption of primary and secondary energy sources consumed for electricity production (published by ministry of mines and energy, http://www.mme.gov.br), a new CEF has been calculated. This new value equals to 75.7 kg/MWh has been integrated to the PDD. Detail calculations have been provided to the DOE. The emission factors from dispatch centres are not publicly available. Data on fuel type, fuel emission factor are sensitive data and consequently not available to us for each of the 1591 power stations referenced by the ministry of Mines and Energy. Consequently, the IPCCC methodology has been used in conjunction with the latest data, 2005 figures, provided by	ex-ante as 0.2677 tCO_2/MWh. The combined margin calculated as per ACM0002 for the Brazilian South-Southeast-Midwest interconnected grid considering data for the years 2003, 2004 and 2005 is 0.2611 tCO_2/MWh and thus the emission factor applied in this project is considered appropriate This CAR has been closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		the Ministry of Mine and Energy.	
CAR 4: The fossil fuel used in the baseline or project activity for pumping equipments or ignition of LFG needs to be included in the monitoring plan.	D.1.2	The project activity will not use fossil fuel: Flare ignition and pumping equipments will be powered by electricity coming from the grid. Section B3 has been modified to clarify this point.	OK. It is made evident that only electricity from the grid will be utilised for flare ignition and pumping equipments and no fossil fuels will be used. The type of flare and extraction system used will need to be checked for during verification of the project activity. This CAR has been closed.
CAR 5: The flare efficiency is considered 100%. This is not a conservative value for the estimation of emissions reduction. The final value used needs to be justified.	E.3.1	Proactiva will use high efficiency flare with a combustion temperature above 700°C and a retention time of 0.3 second. In these conditions, it is expected that the flare efficiency will be 100%. Measurement campaigns have shown that the efficiency of this type of flare is almost 100%. Please, refers to the ERM analysis entitled 'Monitoramento dos Efluentes Gasosos Gerados pela queima em "Flare" de Biogás - Determinação da Concentração de Metano.' or the French study realized by SGS entitled 'Prélèvements et analyses d'effluents gazeux de centre de stockage de déchets Etude rejets CH4.'These studies show that methane cannot be found at the exhaust of flare or only traces which do not significantly impact the flare efficiency.	OK. The flare efficiency considered for the estimation of CERs is 100%. However, after the project implementation this will be estimated as per the methodology. This CAR has been closed.
CAR 6:		The value of 0°C is correct and	OK. These conditions are used for the

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
The value for T, in section B.7.1 is taken to be 0°C. This needs to be corrected to include the average temperature of the landfill gas.		conforms to scientific convention. In order to express a volume or a gas flow which depends on temperature and pressure the scientific convention is to normalised gas volume or gas flow. The Normal conditions of pressure and temperature are 1.013 bar and 0°C. The value of 0°C is the value used in the calculation and gas production model. This temperature is integrated in the methane density used in the model and calculations throughout the PDD. This convention does not impact the ex-ante estimation of Emission Reductions	estimations and thus can be applied. The actual P and T of the LFG will be monitored and will be used for the ex post calculations. This CAR has been closed.
CAR 7: Section B.4 needs to be clearly defined to include all the plausible baseline scenarios and how these alternative are ruled out to arrive at the said baseline scenario.	B.2.1	Section B.4 of the PDD has been amended accordingly.	OK. This CAR has been closed.
CL 1: The project developer is requested to provide: 3. operation permit or license 4. operation contract 5. EIA approval Regulatory or obligatory requirements for LFG capture and flaring may be confirmed against the licenses. The adjustment factor AF is defined as 10% flaring of the captured landfill gas. This needs to be substantiated.	A.3.1 A.2.2 B.2.2	Proactiva provides the following documents, here attached. • Operation license, August 2004 for 7 month • Operation license, September 2005 • 4-month extension of time of the operation license, September 2005 • Installation license, September 2005 • Letter of FATMA, issued 18th of December 2006 **Operation license** In Brazil, the operation license shall be	OK. The operational license and the letter from FATMA were reviewed and it has been confirmed that there are no specific requirements in Brazil for flaring of landfill gas produced. There are no regulatory or obligatory amounts of LFG to be flared but the project proponent is passively flaring about 10% of the gas produced for odour reduction and safety reasons.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
(note 1)		renewed periodically. When it is renewed, it proves that the site conforms to the environmental regulation and recommendations of the Environmental Agency. As mentioned in the operation license, august 2004, clause 1 - General Conditions, the license can be suspended or cancelled in case of non respect of the license conditions. Considering the operation license has been renewed for the Tijuquinhas landfill site and the license obligation haven't been modified since, it proves that the site conforms to the license condition and that the operation of the site is unlikely to change without the CDM project activity. On a regular basis Fatma audits the site and checks the site complies with its requirements. This has been confirmed in the FATMA letter, dated 18th of December 2006. **EIA approval** In addition, as mentioned within the PDD an EIA was submitted to Fatma to comply with their request of environmental diagnostic, mentioned in the operation license of August 2004. The operation licence of 2005 does not mention any more this request proving the EIA has been submitted and fulfilled our obligation. The 2005 licence stands	OK.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		for an approval of the EIA. The environmental licence and the operation license is the same document. To ease the reading of the PDD the referenced to environmental licence has been removed. **<u>Operation Contract</u>** Proactiva owns and operates the landfill of Tijuquinhas. Proactiva has signed contracts with the main cities around the site to dispose their waste. These contracts are not operation contract but only agreement to dispose the waste stream of the municipalities. Consequently, the only operation constraints are coming from the in place national regulation and recommendations of Fatma, defined within the attached operation licence. The letter of the Fatma issued the 18th December 2006 confirms the site comply with the in place regulation and local environmental recommendations. All contracts have been provided to the Validator as requested. The contracts are and shall remain confidential since they are not key element to determine the baseline scenario, and the additionality of the project activity. **<u>AF 10%</u>**	The contracts signed with all the municipalities for waste disposal were reviewed by DNV. The maximum capture rate of 20% considered for AF calculation was deemed conservative on reviewing the SCS reports provided by project

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		The 10%, AF factor has been calculated from data obtain after a 3-day campaign observation. The study distinguish three types of well's categories : • Wells able to burn few days in a raw • Wells able to burn few hours • Wells which cannot sustain combustion The result of the study shows that over the 66 wells in place 46 are able to sustain the combustion for few days, 4 cannot sustain burning for more than few hours and 16 cannot be lit. In order to calculate the efficiency of the existing system, the following conservatives assumption have been taken: • efficiency of this type of combustion is below 50% which is the default combustion efficiency for controlled open flare • The radius of action of each wells is extremely low in the absence of active collection. A very conservative efficiency rate has been selected to 20%. • Wells which could not sustain	proponent. Hence the AF of 10% considered is conservative. This CAR is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		combustion for few hours where considered to be burning for 8 hours. By aggregating these conservative figures, it has been calculated that the efficiency of the actual system cannot exceed 7%. In a very conservative approach, the AF factor has been selected to be 10% (with a 30% margin compare to the already conservative calculation). The detailed calculations are provided within the file "Situacao queimadores1.pdf". The study carried out by SCS for the world bank has been submitted for substantiating the capture rate of 20%.	
CL 2: The project itself without CDM revenue should also be defined as one of the plausible alternatives to the project activity. The project activity itself, (alternative 2) does not need to be mentioned since it is not an alternative to the project.	B.2.6	The Section B.4 and B.5 of the PDD have been modified accordingly within a new version : PDD Tijuquinhas version 2	OK. The revised PDD now includes the project activity without CDM revenues as on of the plausible alternatives. This CL has been closed.
CL 3: The investment analysis for the project activity needs to be provided. (note 1)	B.2.7	Proactiva provides the following financial details : • The detailed cost analysis. • This independent study from the World Bank entitled 'The Landfill Gas-to-Energy Initiative for Latin America and the Caribbean', it provides reference to case-studies which define	The PDD has been revised to incorporate these changes. It has been demonstrated that there are no revenues from the project activity apart from the CER revenues. eg: from bottling and selling of some captured LFG.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		unit price of gas collection and flaring systems in Latin America and in particular in Brazil. The values provided within the version 1 of the PDD's were rounded however the value within the PDD have been adjusted. The verifier will be able to check that no facility exists to distribute Landfill gas through a network towards a final user. In the same way, no compression station is installed on site to allow LFG compression to allow its eventual distribution by road. In addition Landfill gas contains few contaminants which prevent a direct use of the gas without cleaning. No cleaning station is installed on site. Consequently, There is no other source of revenue expected than the sale of CERs.	This CL is closed.
CL 4: The following procedures are requested to be submitted • Procedures for calibration of monitoring equipment need to be submitted. • Procedures for record handling need to be provided (including what records to keep, storage area of records and how to process performance	D.6.5 D.6.8 D.6.9 D.6.11	Procedures have been added into PDD within the section 'B.7.2 Description of the monitoring plan.	The PDD has been revised to include the same. This CL is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
documentation.) • Procedures for dealing with monitoring data adjustments and uncertainties need to be provided. • Procedures for internal audits, performance reviews and corrective actions to be taken need to be identified and submitted.			
CL 5: Please check ACM0001 (version 05) criteria: "In the case where LFG is just flared, one flow meter can be used provided that the meter used is calibrated periodically by an officially accredited entity." The monitoring is not in line with this.	D.5.2	The section B.7.1 and B.7.2 of the PDD have been modified accordingly within a new version : PDD Tijuquinhas version 2	OK. The PDD has been revised to include these changes. OK. This CL is closed
CL 6: The calculation sheets for the emission reductions and the application of the biogas generation model need to be submitted. (note 1)	E.1.2	The detailed calculation has been provided to the DOE.	The calculation sheet for the methane generation and the emission reductions have been checked and deemed to be correct. This CL has been closed.
CL 7: The specific first order decay model used for the calculation of the methane generation needs to be clarified. If it is not the EPA or IPCC model, the model should be provided or a comparison of results applying the EPA LANDGEM model or the IPCC model.	E.1.3 E.3.1	The model used is based on the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, issued in 2000*.	This CL has been closed.
CL 8: The project developer is requested to justify, based on objective facts, why the option of producing electricity is not the most plausible	B.2.6	The alternative scenario consisting in producing electricity from landfill gas is not a plausible solution for several reasons links both to the maturity of this	OK. This CL has been closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
scenario.		technology of lack of sufficient financial incentive. *'The Landfill Gas-to-Energy Initiative for Latin America and the Caribbean'*, published by the World Bank recommends developing LFG projects in two stages. • *"First, a reliable and constant LFG capture and flaring system should be implemented to ensure that the landfill operator is acquainted with the technology and that landfill operation practices do not interfere with the system. "* • *"Second, the energy generation plant should be added once the landfill gas capture system is stable and well calibrated and the methane flow has proven to be as predicted."* In addition, the pre-feasibility study carried out by the World Bank to develop this type of technology have shown, that with current accessible electricity selling price in Brazil and for equivalent site size to the one of Tijuquinhas landfill, this type of projects is not feasible at Tijuquinhas landfill. This comment has been integrated within section B.5 and B.4 of the PDD.	

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL 9: The expected electricity demand needs to be justified.	E.1	Technical specification for a 3000 Nm^3 extraction and flare system shows that the main component consuming energy, the blower, will have a nominal consumption of 30Cv (equivalent to ~22kW). Within the range of operation of the blower, it can be considered that the power consumption will be proportional to the gas flow (the pressure head remaining stable). The assumption of the electricity demand is then confirm to be within the range of 22kWh/3000 = 7 Wh/m^3.	OK. This CL is closed.
CL.10 Table in page 36 includes references to LFGthermal.	PDD	The PDD has been modified accordingly. PDD Tijuquinhas version 2	OK. This CL has been closed.

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APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Filipe Tavares

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 9 & 13		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Mathsy Kutty

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	--		
CDM Validator:	--	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Miguel Rescalvo

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Ricardo Alvarez

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	--	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Wilson Tang

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 13		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes		
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Einar Telnes

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	Yes
CDM Verifier:	Yes	***JI Verifier:***	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3,6 & 10		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0021*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	*AM0023*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0024*	Yes
ACM0004	Yes	*AM0027*	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	*AM0028, AM0034*	Yes
ACM0007	Yes	*AM0030*	Yes
ACM0008	Yes	*AM0031*	Yes
ACM0009, AM0008, AMS-III.B	Yes	*AM0032*	Yes
AM0006, AM0016, AMS-III.D	Yes	*AM0035*	Yes
AM0009, AM0037	Yes	*AM0038*	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	*AM0041*	Yes
AM0014	Yes	*AM0034*	Yes
AM0017	Yes	*AMS-II.A-F*	Yes
AM0018	Yes	*AMS-III.A*	Yes
AM0020	Yes	*AMS-III.E, AMS-III.F*	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director